Communication with Zettelkastens

An Experiential Report

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Translated by Sascha

I

This text is an empirical work in the domain of social science. It concerns me and someone else: My Zettelkasten. It is clear that in this case the normal methods of empirical social science fail. It is nevertheless empirical because it concerns a real research object. And it is research because you can, I hope at least, generalise from it; even though one of the participants, no: both participants, apply the generalisation to themselves.

We need problems, concepts and, when possible, theories to conduct research that can be generalised to other cases. We (me and my Zettelkasten) obviously tend to think of systems theory. But as the framework for this presentation we choose communication theory, because nobody will be surprised that we think of ourselves as systems. But communication, or even successful communication? One of us listening to the other? That needs an explanation.

Zettelkastens can be recommended as communication partners because of the technical-economic problem of doing science. Without writing, you cannot think; at least not in a sophisticated and scientific way. You have to highlight differences somehow and record distinctions either explicitly or embedded in concepts; only the hereby secured consistency of the schema that produces information guarantees the coherence of the subsequent information processing. If you have to write anyway, it is pragmatic to exploit this activity by creating a system of notes that can act as a competent communication partner.

It is an obligatory condition for communication that both partners can surprise each other. Only in that way can information be created in the respective other. Information is an event that happens inside the system. Information is created when a message, an entry [of a note], is compared with other possibilities. Therefore, information is only created in systems that possess a comparison schema (even when this schema is merely: "this or something else"). For communication to be possible, it is not required that both communication partners have the same comparison schema; the level of surprise even increases when this is not the case, and when you consider it to be a coincidence that a message is meaningful or even useful against a background of other possibilities. Put differently: the variety in the communicating system increases if it can happen that both partners communicate successfully (meaning: useful for one communication partner) in spite of their different comparison schemas. This requires randomness to be built into the system. "Randomness"

means: It is not guaranteed that the comparison schemata match or that the information that is transmitted by the communication[1] are accurate, but that information is created through the interaction of both partners.

There are two ways for a communication system to maintain its integrity over long periods of time: you need to decide for either highly technical specialisation, or for a setup that incorporates coincidence and *ad hoc* generated information. Translated to note collections: you can choose a setup categorized by topics, or an open one. We chose the latter and, after 26 successful years with only occasionally difficult teamwork, we can report that this way is successful—or at least possible.

Naturally, a setup of a communicating system that is meant to be enduring, open, and not topically restricted (it is restricted by itself) needs to adhere to certain structural requirements. Given the still high trust in human capabilities we may trust us humans to meet those requirements. But what about the Zettelkasten? How should the Zettelkasten be designed to make it capable of communication?[2]

It is not possible to answer this question by deducting the best choice from reviewing all the possibilities. We remain on experiential ground and just provide a theory-infused description.

II

THE EQUIPMENT FOR the Zettelkasten consists of wooden boxes with drawers that open to the front, and DIN A6 paper slips. You should only write on the front side of the paper slips, so it is possible to read the note during searches without the need to take it out. It is true that this doubles the space needed (not entirely, since not all paper slips would have been written on the back anyway) which could be problematic because after decades of using the Zettelkasten it might become impossible to access it from your place at the desk. To mitigate this issue, it is recommended to use normal (thin) paper instead of (thick) index cards.

However, the external form just has an effect on convenience and not the power of the Zettelkasten. The inner workings, the arrangement of the notes, the mind of the Zettelkasten depend on a decision not to order notes by topics and subtopics, and instead choose an order with fixed placement. A content-based system (like a book's table of contents) would mean that you would have to adhere to a single structure forever (decades in advance!). If you assume that this communication system and oneself can evolve, this will necessarily result in unsolvable problems where to place a note. The fixed-place orderdering doesn't require topical ordering. It is enough to assign a number to each note, place it so that it's easy to see (top left for us), and never change it, and thus never change the note's place. This structural decision is exactly that reduction of complexity of possible arrangements that unlocks the creation of high complexity within the Zettelkasten and thus creates its ability to communicate in the first place.

The fixed-place numbering, abstracted from any content ordering, has several advantages that together enable a higher kind of order. Those advantages are:

1 The German is as clunky as the English translation. Look up the explanation on Luhmann's concept of information for the reason.

2 The original says: "kommunikative Kompetenz" which translates directly to "communicative competence" or "communication skills". The main point is *that* the Zettelkasten can communicate.

1. *Free internal branching.* You don't need to add notes at the end, but you can connect them anywhere, even to single words within a text. A note with the number 57/12 can be continued with 57/13, but it could also be complemented from a word or a thought with 57/12a, which in turn could be continued with 57/12b etc.; to which in turn 57/12a1 could be attached. In the note itself, I use red letters or numbers to mark the place of connection. There can be multiple possible connections on each note. This enables internal growth of the system without systematic pre-programming and without depending on sequential linearity. The downside is that the original running text may often be interrupted by hundreds of in-between notes; yet, you can easily recover the original context if you are methodological with the numbering.

2. *Opportunity to connect.* Because all notes have a fixed number, you can create as many references on each note as you want. Central concepts could be laden with a lot of references that indicate in which other contexts related information can be found. References allow solving the "multiple storage problem" without significant investment of labor or paper. With this technique it is not important[3] where you place a new note. When there are multiple options you can solve the problem by placing the note wherever you want and create references to capture other possible contexts. Often, the situation in which you decide to take a note suggests numerous connections to already existing notes, especially when the Zettelkasten is large. It is important, then, to capture those connections both radially and with cross-references to attractors. This step of the process also enriches the content of what you take note of.

3. *Register.* Considering that there is no topical order, you have to put a search mechanism in place because you cannot rely on your numerical memory. (Alternating numbers and letters helps the memory and may be an optical aid when searching notes, but is of course not enough). It is therefore necessary to maintain a keyword index. Also for this, the numbering of the note is essential. You can connect a parallel tool with your literature management system. Bibliographical notes that you extract from literature should be captured inside the Zettelkasten. Books, articles, etc. that you actually have read should each get individual notes that belong in a separate section and that contain the bibliographical information. This allows you in the longer run to distinguish what source you have actually read and what source you have just collected for later use. The bibliographical notes also allow you to add references to the notes that are based on these sources, or that were inspired by them. This will prove useful because your own memory—others will have a similar experience to mine—works in part with keywords and in part with author names.

The result of working with this technique for a long time is a kind of second memory, an alter ego with which you can always communicate. It has, similar to our own memory, no pre-planned comprehensive order, no hierarchy, and surely no linear structure like a book. And by that very fact, it is alive independently of its author. The entire note collection can only be described as a mess, but at least it is a mess with a

3 The original says: "Bei dieser Technik is es weniger wichtig, wo eine neue Notiz eingeordnet wird." Direct translation: "With this technique it is *less important* where you place a new note." In German, there is often a paradox phrasing in which you soften the firmness of your statement but actually mean to make a firm statement. It is neither humbleness nor a conscious softening of the statement. It's rather a layer of typical German politeness which is perfected in Swiss German.

non-arbitrary internal structure.[4] Something will seep away. Some notes you will never see again. On the other hand, there are preferred hubs, cluster formations, and parts with which you work more often than with others. There will be large projected idea complexes that are never realised; and there are minor ideas that enrich themselves and accumulate; starting at a subsidiary part of the text, and tending to dominate the system. To summarise: this technique ensures that the order—which is just *pro forma*—does not become a mental straightjacket, but adapts itself to the thought development.

Knowledge theory has given up the assumption of "privileged concepts" that function as axiomatic foundations to control the logical value of other concepts or propositions.[5] Similarly, you must give up the assumption that there are privileged places, notes of special and knowledge-ensuring quality. Each note is just an element that gets its value from being a part of a network of references and cross-references in the system. A note that is not connected to this network will get lost in the Zettelkasten, and will be forgotten by the Zettelkasten. Its rediscovery depends on chance, and also on it coincidentally being meaningful at the moment of finding it back.

III

If you want to raise a communication partner, it is beneficial to equip it with independence from the start. A Zettelkasten that is constructed based on our instructions can achieve high independence. There may be other ways to achieve this goal. The described reduction to a fixed-placement (but merely formal) order, and the corresponding combination of order and disorder, is at least one of them.

Naturally, independence presupposes a minimal amount of intrinsic complexity. The Zettelkasten needs a couple of years to reach critical mass. Until then, it is merely a container from which you get what you put in. This changes with increasing size and complexity. The number of entry points and ways to query increases. It becomes a universal instrument. You can store nearly everything, and not merely ad hoc and in isolation, but with the possibility of internal connections. It becomes a sensitive system that internally reacts to many ideas, as long as you can note them down. You could ask, for example, why museums are empty while exhibitions of *Monet*, *Picasso*, *Medici* are overcrowded; the Zettelkasten accepts this question through the connection of "preference for what is limited in time". Certainly, as this example tries to show, the internally available connections are selective. They lie in the realm of the non-obvious, because the system boundary between the note taker and the Zettelkasten has to be crossed. A new entry can also isolate itself—for example through a new keyword Picasso for the Picasso exhibition. However, if you try to communicate with your Zettelkasten you have to look for internal connection opportunities that result in something unexpected (i.e., information). You can try to generalise the experiences from Paris, Florence, New York via general concepts

4 [Original footnote] A fitting comparison would be a garbage can that also served as a model for organisations. Cf. Michael D. Cohen/James G. March/Johan P. Olsen, "A Garbage Can Model of Organizational Choice", *Administrative Science Quarterly* 17 (1972), pp. 1–25.

5 [Original footnote] Cf. Richard Rorty, *Der Spiegel der Natur: Eine Kritik der Philosophie, dt. Übers.* Frankfurt 1981, p. 185 ff. [Comment by Sascha: Richard Rorty, *Philosophy and the Mirror of Nature*, 1979.]

like "art" or "exhibition" or "crowding (interactionistic)" or "crowd" or "freedom" or "culture" and see whether the Zettelkasten reacts. It is usually most productive to search for problem statements that relate heterogeneous concepts to each other.

In any case, the communication is enriched if you succeed to activate the internal network of connections upon note entry and retrieval. Human memory also does not operate as the result of item-by-item accesses, but uses internal relationing and is only productive in the sphere of reduction of its own complexity.[6] In this way—at this point in space and time and caused by the search impulse—more information becomes available than expected during the search query; and particularly more information than has ever been stored in the form of notes. The Zettelkasten provides combinatorial possibilities that were never planned, never pre-meditated, or never designed in this way. This innovation mechanism is on the one hand based on the search query's ability to provoke relational possibilities that were never laid out; on the other hand, on meeting internal selection horizons and comparison opportunities that are not identical to its own search schema.

Compared to this structure that offers actualizable connection possibilities, the relevance of the actual content of the note subsides. Much of it quickly becomes useless or is unusable for a concrete occasion. That is true for both collected quotes, which are only worth collecting when they are exceptionally concise, and for your own thoughts. Scientific publications thus don't emerge, at least from my experience, by copying the note content that was intended for publishing. The communication with the Zettelkasten becomes productive only on more abstract way, namely on the sphere of communicative relationing of relations. And it becomes productive only in the moment of evaluation, meaning time-bound and highly incidentally.

IV

You might ask whether the results of such a communication, too, are just incidental products. However, that would be too quick a conjecture. In science, the role of randomness is controversial. But if you think in evolutionary models, randomness has a prominent role.[7] Without it, nothing progresses anyhow. Without variation on given ideas, there are no possibilities of scrutiny and selection of innovations. Therefore, the actual challenge becomes generating incidents with sufficiently high chances of selection. We know from analyses of mutation processes in the realm of organic evolution that mutations are complex and finely regulated processes, and only have the stability that is necessary for selective success if they are subjected to pre-selection. They are incidents in the sense that they are not coordinated with the factors that select; but they are nevertheless conditioned by complex regulations themselves.

6 [Original footnote] Cf. W. Ross Ashby, "The Place of the Brain in the Natural World", *Biosystems* 1 (1967), pp. 95–104, especially and also with regard to the inadequacy of computer technology in this respect in particular.

7 [Original footnote] Cf. e.g. Donald W. Campbell, "Variation and Selective Retention in Socio-Cultural Evolution", *General Systems* 14 (1969), pp. 60–85; id. "Evolutionary Epistemology", in: Paul Arthur Schlapp (ed.), *The Philosophy of Karl Popper*, La Salle, Ill. 1974, Vol. 1, pp. 412–463.

The allegory shouldn't be overused; but you wouldn't go wrong by assuming that in the social domain, and especially in scientific research, order also emerges from the combination of order and disorder.[8] his specification of emergence does not negate scrutinization, it rather enables it. Contrary to the old distinction of emergence and validity, nowadays, we assume that it is both impossible and methodologically unsound to isolate these aspects; that is because the generation of random stimuli needs organisation, if only to match the requirements of speed, frequency and success rate posed in a dynamic society.

On this abstract level of communication that is related to the philosophy of science as well as towards empirical research, the Zettelkasten is surely just one of many possibilities. Incidents during reading play a role, and even misunderstandings caused by interdisciplinary thought processes. Last but not least, the traditional "unity of research and education" is a source of friction that generates incidents. We can confirm that communication with Zettelkastens, compared to other options, is a viable solution and has many advantages regarding information density, speed, and mutual amenability. ⋄

Translator's Note

The original article by Luhmann is charged with his unique concepts that he developed for his social systems theory and a laconic German that is typical to the north of Germany. This is a strange challenge for any translator since you want to be faithful to the original, but at the same time there is a need similar to transposition in music: Transposition means that you lift *everything* up a pitch. I'd like to show you a translation of a paragraph that highlights the issue of translation itself:

> French is a fine park, Italian a big, bright, colorful wood. But German is almost a primeval forest, so dense and mysterious, so without a passage and yet with a thousand paths. You can't get lost in a park, and not so easily and dangerously in the bright Italian wood; but in the German jungle, within four, five minutes, you can go missing. Because the path seems so difficult, many try to march through as straight as possible, which violates the nature of this language. It surely wants a main direction but invites deviating from to the left and to the right by its hundred paths and pathlets, and shortly back to it.[9]

Take the German word "selbstbewusst". It has the same origin as the English "self-conscious". But the meaning is the opposite. In German, it is connoted with having a strong self-esteem. In

8 [Original footnote] A view that has become almost fashionable today. Cf. e.g. Henri Atlan, "Du bruit comme principe d'auto-organisation", *Communications* 18 (1972), pp. 21–36; Anthony Wilden, "L'écriture et le bruit dans la morphogenèse du système ouvert", *Communications* 18 (1972), pp. 48–71. My Zettalkasten returns under the number 21/13d26g104,1 the references: self-reference, noise, morphogenesis/self-organisation, system/environment, evolution (variation), difference.

9 This is my translation of a passage from Ludwig Reiners (1967 (Erstausgabe: 1943)): *Stilkunst. Ein Lehrbuch deutscher Prosa*, München: C. H. Beck, p. 21.

English, it is connoted with having low self-esteem. Think back to the metaphor of music: A note does not have a mood. The mood is in the relationship to other notes. But it feels as if the note itself has mood.

There are nine pending explanations of specific terms Luhmann used (e.g., "communicative relationing of relations"). Luhmann seemed to have fallen into the habit of talking in terms that can only be properly understood if you are familiar with his work. The late Wittgenstein would be either happy or sad, depending on whether he talked to Luhmann or about Luhmann. So if a section seems rather opaque or even bizarre to you, ask in the forum, and perhaps it will trigger a pending explanation. But don't count on fast reaction times since I am taking a break from Luhmann because of a Luhmannian overdose.

Comments on the Translation

The original is: Niklas Luhmann (1981): *Kommunikation mit Zettelkästen: Ein Erfahrungsbericht*, Opladen: Westdeutscher Verlag.

Manfred Kühn created the first translation. Many thanks for your service!

My priority is accessibility: If I had to make the decision between Luhmann's specific writing style and understandability, I chose the latter.

German is in itself a technical and literal language. A telling example is the German word for "nipple": "Brustwarze" is directly translated to "breast wart". So, keep that in mind if you want to express your love in German. Another example would be "Menschenauflauf" which is directly translated to "human casserole" but means "confluence" or even just "crowd".

Luhmann had a very technical style of writing that sometimes is connected to his way of thinking and sometimes just an artifact of his unique style of speaking and writing. Luhmann spoke in a "ready to print"-way,[10] which is often just the ability to avoid messing up complicated speech. I tried to distinguish both causes of his technical style and sometimes chose an easier to understand formulation if necessary.

In German, the indefinite pronoun "man" (as in: "Man kann das.", literally: "One can do this.") is used commonly, especially in more "introvert" context (dialects, people etc.). I sometimes opted to use "you" instead to enhance the readability since I feel that using "one" felt awkward in English.

I decided to translate the German "Zettelkasten" as "Zettelkasten" since I consider this an established term.

I chose "Zettelkastens" as plural since the "ä" in "Zettelkästen" feels too foreign and too disrespectful towards the English language to inject.

"Zettel" is an ambiguous term. I decided to translate it into "paper slip" when Luhmann seems to refer to actual physical piece and "note" when he refers to the individual note in his Zettelkasten.

10 Niklas Luhmann (2009): *Einführung in die Systemtheorie*, Heidelberg: Carl-Auer Verlag, p. 7.

"Zufall" (''chance'') can be translated as "randomness" or "coincidence". I tried to choose the term that reflects the underlying tone of the sentences. Sometimes it is not just about the randomness in itself but the slightly positively connoted "coincidence". I like to imagine that Bob Ross lends his voice to point to the "happy accidents" that happen while working with Zettelkastens.

Special Thanks

Thank you, Alex Nelson, for your helpful comments!